

Claims:

1. A method for performing multicast transmission in a cellular network which includes mobile stations (MS), the method comprising the steps of
- 5 of
- transmitting a multicast service notification to a certain multicast group, said notification to inform of an upcoming multicast session,
 - receiving the multicast service notification in mobile stations belonging to said multicast group,
 - 10 - in response to said receiving step, selecting a moment for a response to said multicast service notification in said mobile stations,
 - sending a presence report from at least one of said mobile stations at the response moment of said at least one mobile station,
 - receiving the presence report(s) in a radio access network,
 - 15 - setting up radio resources for multicast transmission in a cell of the cellular network, when the presence report(s) received in said cell meet(s) predetermined criteria, and
 - transmitting the multicast data using the radio resources set up for the multicast transmission.
- 20 2. A method according to claim 1, wherein the response moment is specific to each of said mobile stations within a certain upcoming time period.
3. A method according to claim 2, further comprising the steps of
- informing at least some of said mobile stations of a presence report received in the radio access network and
 - 25 - in response to said informing step, canceling the sending of the presence report in a mobile station waiting for its response moment to arrive.
4. A method according to claim 3, wherein said informing step includes sending a radio bearer assignment notification to said mobile stations in response to the setting up step.
- 30 5. A method according to claim 2, wherein the selecting step includes selecting a random response moment within said upcoming time period.
6. A method according to claim 5, further comprising the step of sending information on the length of the time period in the multicast service notification.
- 35 7. A method according to claim 1, further including the step of

checking the locations of said mobile stations in the cellular network.

8. A method according to claim 7, wherein the locations are checked at the routing area level, whereby the identities of the routing areas are obtained where the mobile stations are located.

5 9. A method according to claim 8, wherein the transmitting of the multicast service notification includes transmitting said notification to all cells in the routing areas where the mobile stations are located.

10 10. A method according to claim 8, further comprising the step of checking the locations of at least some of said mobile stations at the cell level, whereby a set of cells are obtained containing mobile stations belonging to the multicast group.

15 11. A method according to claim 10, wherein the transmitting of the multicast service notification includes transmitting said notification within all cells in the routing areas where the mobile stations are located, except within said set of cells.

12. A method according to claim 1, wherein the setting up of the radio resources is performed for a cell when the number of presence reports received from the cell reaches a predetermined limit.

13. A method according to claim 12, wherein said limit is one.

20 14. A method according to claim 2, wherein the transmitting of the multicast service notification includes transmitting said notification periodically during said time period.

25 15. A method according to claims 14 and 6, further comprising the step of updating the length of the time period in the notifications transmitted periodically.

16. A method according to claim 1, further comprising the step of monitoring the number of members of the multicast group in a cell during the multicast session.

30 17. A method according to claim 1, further comprising the step of authenticating at least one of the mobile stations prior to the transmitting of the multicast data.

18. A method according to claim 17, wherein the authenticating step includes (1) inserting a challenge in the multicast service notification and (2) returning a response in the presence report.

35 19. A system for performing multicast transmission in a cellular

network, the system comprising

- a radio access network (110) adapted to transmit a multicast service notification to mobile stations belonging to a multicast group,

- in said mobile stations, first means for selecting a moment for a response to said multicast service notification and for sending a presence report to the radio access network when the response moment arrives, whereby the radio access network is adapted to receive the presence reports,

- second means for establishing radio resources for the multicast transmission in individual cells of the cellular network, the second means being adapted to establish the radio resources for a cell when the presence report(s) received in the cell meet(s) predetermined criteria.

20. A system according to claim 19, wherein the second means are adapted to establish the radio resources for a cell when the number of presence reports received from the cell reaches a predetermined limit.

15 21. A system according to claim 20, wherein said limit is one.

22. A system according to claim 20, further comprising termination means in said mobile stations, said termination means being adapted to cancel the sending of the presence report in response to the reception of a predetermined message.

20 23. A system according to claim 22, wherein at least one of the mobile stations is adapted to cancel the sending of the presence report in response to receiving a presence report sent by another mobile station.

24. A system according to claim 22, wherein the predetermined message indicates that the radio resources have been established.

25 25. A system according to claim 19, wherein said first means are adapted to select a random moment from within a given time period.

26. A system according to claim 19, wherein the system further comprises authentication means for authenticating the mobile stations.

30 27. A mobile station for a cellular network, the mobile station comprising

- reception means for receiving a multicast service notification informing of an upcoming multicast session,

- response means for selecting a moment for a response to said multicast service notification and for sending a presence report at the response moment, the presence report indicating the willingness of the mobile

station to receive the multicast service,

whereby the reception means are adapted to receive a notification informing of a presence report sent by another mobile station.

5 **28.** A mobile station according to claim 27, wherein the response means are adapted to cancel the sending of the presence report in response to the notification informing of a presence report sent by another mobile station.

29. A mobile station according to claim 27, wherein the response means include timer means adapted to expire at the response moment.